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CITY OF CHICAGO

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US House of Representatives Energy and Commerce Committee  
Subcommittee on Digital Commerce and Consumer Protection  
Disrupter Series: Smart Communities Hearing

Written Statement

March 16, 2017

Thank you Chairman Latta and Ranking Member Schakowsky, and members of the Committee for inviting me to speak today about Smart Cities. My name is Brenna Berman, and I serve as the Commissioner for Chicago's Department of Innovation and Technology – as the CIO for the City.

Chicago, as you know, is the third largest City in the country; a global city with world-class architecture, universities, and cultural institutions. Chicago has been ranked #1 for Corporate Relocation and Expansion for the fourth consecutive year, the City is #2 on the Inc. 5000 Fastest Growing Companies list, and named one of the top 10 hot spots of 2020 by the Economist Intelligence Unit. We are also #6 on KPMG's list of cities expected to be top global tech innovation hub over the next four years.

The most dynamic cities in the world equip their communities with leading-edge technology that engages, informs, and empowers. Mayor Emanuel's vision for achieving this is built on a commitment to modern infrastructure, smart communities, and technological innovation. Chicago is continuing to realize its potential as a city where technology fuels opportunity, inclusion, engagement, and innovation for all. In Chicago, we believe that the power of technology is driven by the people who utilize it and the improvements to their quality of life.

In Chicago, we've applied "Smart City" tools like open data, predictive analytics, and sensor technology to public health, public safety, and improving our environment, among other public challenges. These tools have helped us become more responsive to our community, faster and more efficient in our service delivery, and smarter about our investments and policies. Working with these technologies, we are not only a smart city, but one that is anchored in equality and fairness. As we continue integrating the city's physical, digital and human systems our goal is to provide residents with a sustainable, prosperous and inclusive future.

#### *Open Data and Service Delivery Improvement*

Step one in becoming a smart city is examining and sometimes changing the way the City collects, shares, and uses data. In a City the size of Chicago, millions of data points are recorded all of the time – from the location of snow plows during a blizzard to the number of potholes filled to city permits issued. In the past six years, Chicago has emerged on the forefront of collecting, sharing, and applying data to inform the public and make decisions.

In 2011, Mayor Emanuel launched the City's first-ever open data portal, providing hundreds of City data sets to the public for the first time: ranging from business licenses, crimes, and food inspections to conditions of our beaches, taxi trips, and more.. One million people visit the data portal annually. Students, journalists, professors, programmers, and researchers access the now more than 600 datasets to increase their own understanding of the city or produce apps that are useful for others. For example, a team of community developers used open data to illustrate the energy consumption of each building in Chicago to increase awareness of usage throughout the year. (*See Appendix A for screen shots of the Chicago Open Data Portal*)

Last year, we launched our own OpenGrid app that allows residents use their phones to better visualize open data about their communities. For example, if you're moving to a new neighborhood, you could pull up business maps and school information; or if you're trying to plan out your weekend you can see how traffic might be impacted by construction or a festival. Thousands of city residents are using OpenGrid today to make their lives easier, turning open data into a deeper understanding of their communities. This app was developed in an open source format so it can be shared with other cities that have similar goals. (*See Appendix B for screen shorts of the OpenGrid*)

We also took a closer look at how we could better use the data we collected to drive decisions or predict issues. We began applying different data sets together and using predictive analytics to help the city run more efficiently and effectively. For example, we've been able to devise algorithms to help our public health department forecast food inspections violations seven days sooner, which helps them address threats to public health more quickly. We have applied predictive analytics to rodent baiting, *E. Coli* levels in Lake Michigan, and West Nile Virus cases across the city. These projects help improve critical services to the public; we are able to prevent some issues before they arise and respond more quickly to emerging situations. (*See Appendix C for Overview of Predictive Restaurant Inspections*)

Combining our efforts to be transparent and to use our data in innovative ways, we launched a SmartData Platform in 2013, the country's first municipal open-source predictive analytics platform. This initiative won the 2013 Bloomberg Philanthropies Mayors Challenge. This platform can analyze millions of lines of data in real-time to help leaders make more informed, faster decisions to help address and prevent problems before they arise. We continue to expand this platform in new ways: efforts to improve elevator inspections, black-market cigarette detection, lead poisoning prevention, and pothole location, among others, are currently in progress.

### *New Data for Deeper Understanding*

This is where we really become a "Smart City" -- data is moving outside of the IT department to become embedded into the physical infrastructure of the city, helping it function at unprecedented new levels of efficiency and effectiveness. This is what everyone means when they say "the internet of things" -- new data is being collected automatically through sensors and is telling us what might come next, if we're paying attention.

Chicago is home to some of the leading universities and research institutions in the country, Fortune 500 companies, and innovative start-ups. Bringing leaders in the private, nonprofit, and academic sectors together with City residents we can accomplish more for everyone who has a stake in our city's future.

In 2015, UI Labs, a consortium of Chicago research institutions and corporations, launched a smart City accelerator, City Digital, to harness the collective energies of more than 300 organizations to apply cutting edge technology and integrated data solutions to urban infrastructure challenges in Chicago.

With our City Digital partners, we can tackle bigger problems, like storm water and flooding. While data can tell us what areas are likely to flood, with our partners and new technology, we are able to do something about the problem. We combined green infrastructure solutions such as high water retention plants and absorbent ground covering with sensors to measure their effectiveness. These sensors were connected with a WIFI network to bring the data together to be analyzed and displayed on a management dashboard. That way, water department workers can easily see the impact the new infrastructure is having and make better decisions about similar investments in the future. Chicago and cities across the country will benefit from this research, which will lead to improvements in design and management of these projects. (*Appendix D: Smart Green Infrastructure Diagram*)

### *Urban Scale Connected Infrastructure Projects*

Chicago is committed to efforts to merge its built environment with its digital environment. Right now we are doing this through two projects: Smart lighting and the *Array of Things*.

The City recently announced a smart lighting initiative, which will install new LED-based street lights across the city. Not only are these lights more energy efficient, but they will communicate with each other and with city systems. For example, when a street light goes out, we won't have to rely on a neighbor

reporting it or an inspector noticing and logging it – the streetlight itself will alert relevant city departments. We know that simple street light outages are associated with small spikes in crime. Being more responsive and better able to respond quickly not only addresses the immediate neighborhood need to fix the light, but also improves public safety.

At the same time, with funding from the National Science Foundation, we are working with the University of Chicago and Argonne National Laboratories, on the *Array of Things*, a first-of-its-kind urban sensing project that consists of a network of interactive, modular sensor boxes installed around the city—essentially serving as a “fitness tracker” to collect real-time data on Chicago’s environment, infrastructure, and activity for research and public use. While several cities have launched pilot projects around ideas like the Array of Things, Chicago is the first city to implement such a program on a city-wide scale.

Data generated by the Array of Things’ sensors will help anticipate floods, traffic safety incidents, and other challenges. With its data being made open and free to the public, the initiative supports researchers, policymakers, developers and residents to work together and take specific actions that will make Chicago healthier and more livable.

Such work could include the development of innovative applications, such as a mobile application that maps out the best route for a cyclist to take from their home to office based on air quality for a given day. As its technology is fully replicable, other cities have taken notice, too, including Denver and Seattle in the United States, as well as Mexico City, Amsterdam, and cities in the United Kingdom, among others. (*Appendix E: Additional Array of Things materials*)

#### *Factors that lead to a successful Smart City*

Our Smart Cities work is showing early signs of success for three reasons. First, our projects are conceived to achieve a well-defined outcome. In the case of the smart street light project, the LED retrofit, will recoup an approximate 50% energy savings. In addition, the smart network that will link all of Chicago’s lights is the foundation for additional use cases that increase the city’s safety and service response time. Those benefits were defined from the inception of the program.

Second, each program was designed with security and privacy in mind from the beginning. In Chicago, we developed our first public privacy policy with resident input to support the Array of Things and the policy was buttressed by a security model that protects the data at the heart of that program. Both the privacy policy and security model are available to the public on the Array of Things website to support a bond of public trust with transparency, a critical element to a project visible in the public way.

Third, they are each based on innovative partnerships that allow the city to know new things and act in new ways. The smart street light program requires partnership across traditional government silos to provide improved service for residents. City Digital is driven by the collaboration of public and private entities committed to R&D in a live city test bed. Finally, the Array of Things would not have been possible without the unique partnership of a City, University and national laboratory.

However, the most important partnership is the one between City and its residents. Smart city projects are often complicated to implement, visible in the public way and difficult to explain. This can cause suspicion and lack of support from the public. However, with early engagement and thoughtful discussion, residents can and should be partners in these projects, and can define future projects.

The same can be true for peer cities. Nearly every city in the US is facing similar challenges as their resources become more limited and their residents’ needs increase. Partnering across cities can be a source of inspiration, insight and even joint investment. In November, Chicago, along with several US

cities including DC and San Francisco, launched the Council of Global City CIOs to further the goal of cross-city IoT collaboration. This council, made up of 10 US cities with mature IoT programs, is committed to joint smart cities partnerships. (*Appendix F: Council of Global City CIOs Article*)

These initiatives – from those at City Digital, to the Array of Things, to Chicago’s advanced data efforts – all fall under Chicago’s bold and comprehensive vision for being a smart city. That vision is guided by informed, data-driven decision-making and a collaborative, inclusive process for fostering and promoting innovation. Chicago hopes that its current efforts will help define the city—and cities around the world—well into the next century.

Indeed, while technology is evolving far more quickly now than ever before, the principles of efficiency, sustainability, and a better quality of life for all, still ring true. Smart Chicago understands that staying at the leading edge of technology is essential to becoming a truly smart city. The city is committed to collaborative, urban innovation, and to share its insights with the world, so that we may all grow together in the process.